

What is claimed is:

1. A keyboard slide mechanism for use in a keyboard that is so structured that key tops are raised and lowered as a sliding member is slid, comprising:

a rotary member that can be rotated;

converting means for converting rotating movement of the rotary member into translating movement; and

movement magnifying means for magnifying the translating movement produced by the converting means,

wherein the key tops are raised and lowered by converting the rotating movement of the rotary member into translating movement with the converting means, then magnifying the translating movement with the movement magnifying means, and then transmitting the magnified translating movement to the sliding member.

2. A keyboard slide mechanism for use in a keyboard that is so structured that key tops are raised and lowered as a sliding member is slid, comprising:

a rotary member that can be rotated;

a cam member for converting rotating movement of the rotary member into translating movement; and

a lever member for magnifying the translating movement produced by the cam member,

wherein the key tops are raised and lowered by converting the rotating movement of the rotary member into translating movement with the cam member, then magnifying the translating movement with the lever member, and then transmitting the magnified translating movement to the sliding member.

3. A keyboard slide mechanism as claimed in claim 1,

wherein keys of the keyboard are individually provided with linking members and, as the sliding member is slid, the linking members rotate in such a way as to raise and lower the key tops placed on the linking member.

4. A keyboard slide mechanism as claimed in claim 2,

wherein keys of the keyboard are individually provided with linking members and, as the sliding member is slid, the linking members rotate in such a way as to raise and lower the key tops placed on the linking member.

5. A keyboard slide mechanism as claimed in claim 1,

wherein the sliding member slides parallel to a rotation shaft of the rotary member.

6. A keyboard slide mechanism as claimed in claim 2,

wherein the sliding member slides parallel to a rotation shaft of the rotary member.

7. A keyboard slide mechanism as claimed in claim 2,

wherein the lever member is as thick as or less thick than the cam member.

8. A keyboard slide mechanism as claimed in claim 2,

wherein the cam member comprises a first cam that rotates together with the rotating movement of the rotary member and a second cam that translates as rotating movement of the first cam is transmitted thereto through cam surfaces of the first and second cams, and

movement of the second cam is transmitted to the lever member.

9. A keyboard slide mechanism as claimed in claim 8,  
wherein the first and second cams are arranged in contact with each other on a rotation shaft of the rotary member,

the first cam rotating together with the rotation shaft and the second cam sliding axially along the rotation shaft.

10. A keyboard slide mechanism as claimed in claim 8,  
wherein, on a plane on which the first and second cams make contact with each other, at least one surface of at least one of the first and second cams is perpendicular to the rotation shaft.

11. A keyboard slide mechanism as claimed in claim 8,  
wherein the cam member comprises two first cams that rotate together with the rotating movement of the rotary member and a second cam that translates as rotating movement of the first cams is transmitted thereto through cam surfaces of the first and second cams,

the second cam being arranged between and in contact with the first cams and having cam surfaces formed on both sides thereof facing the first cams,

one of the first cams engaging with the second cam when the key tops of the keyboard are lowered,

the other of the first cams engaging with the second cam when the key tops of the keyboard are raised.

12. An information device comprising a keyboard that is so structured that key tops are raised and lowered as a sliding member is slid, a lid portion that can be opened and closed with respect to a body portion in which the keyboard is housed, and a keyboard slide mechanism that makes the sliding member slide as the lid portion is opened and closed,

wherein the keyboard slide mechanism comprises:

a rotary member that rotates as the lid portion is opened and closed;

converting means for converting rotating movement of the rotary member into translating movement; and

movement magnifying means for magnifying the translating movement produced by the converting means,

wherein, as the lid portion is opened and closed, the rotary member rotates, and the key tops are raised and lowered by converting the rotating movement of the rotary member into translating movement with the converting means, then magnifying the translating movement with the movement magnifying means, and then transmitting the magnified translating movement to the sliding member.

13. An information device comprising a keyboard that is so structured that key tops are raised and lowered as a sliding member is slid, a lid portion that can be opened and closed with respect to a body portion in which the keyboard is housed, and a keyboard slide mechanism that makes the sliding member slide as the lid portion is opened and closed,

wherein the keyboard slide mechanism comprises:

a rotary member that rotates as the lid portion is opened and closed;

a cam member for converting rotating movement of the rotary member into

translating movement; and

a lever member for magnifying the translating movement produced by the cam member,

wherein, as the lid portion is opened and closed, the rotary member rotates, and the key tops are raised and lowered by converting the rotating movement of the rotary member into translating movement with the cam member, then magnifying the translating movement with the lever member, and then transmitting the magnified translating movement to the sliding member.

14. An information device comprising a keyboard slide mechanism as claimed in claim 12,

wherein keys of the keyboard are individually provided with linking members and, as the sliding member is slid, the linking members rotate in such a way as to raise and lower the key tops placed on the linking member.

15. An information device comprising a keyboard slide mechanism as claimed in claim 13,

wherein keys of the keyboard are individually provided with linking members and, as the sliding member is slid, the linking members rotate in such a way as to raise and lower the key tops placed on the linking member.

16. An information device comprising a keyboard slide mechanism as claimed in claim 12,

wherein the lid portion can be opened and closed with respect to the body portion by

being rotated about a rotary joint and, when the lid portion is opened to a predetermined angle with respect to the body portion, the key tops are raised to a predetermined height so as to be brought into a state ready for key input but, even when the lid portion is opened to over the predetermined angle, the key tops are kept in the state ready for key input without being raised further.

17. An information device comprising a keyboard slide mechanism as claimed in claim 13,

wherein the lid portion can be opened and closed with respect to the body portion by being rotated about a rotary joint and, when the lid portion is opened to a predetermined angle with respect to the body portion, the key tops are raised to a predetermined height so as to be brought into a state ready for key input but, even when the lid portion is opened to over the predetermined angle, the key tops are kept in the state ready for key input without being raised further.

18. An information device comprising a keyboard slide mechanism as claimed in claim 16,

wherein the following conditional formula is fulfilled:

$$\theta \geq \tan^{-1} [ (h + t) / l ]$$

where

$\theta$  represents the predetermined angle of the lid portion with respect to the body portion;

- h* represents the predetermined height from a top surface of the body portion to a top surface of the key tops in the state ready for key input;
- t* represents a thickness of a finger inserted between the key tops and the lid portion; and
- l* represents a distance from the rotary joint to a center of a key top nearest thereto.

19. An information device comprising a keyboard slide mechanism as claimed in claim 17,

wherein the following conditional formula is fulfilled:

$$\theta \geq \tan^{-1} [(h + t) / l]$$

where

- $\theta$  represents the predetermined angle of the lid portion with respect to the body portion;
- h* represents the predetermined height from a top surface of the body portion to a top surface of the key tops in the state ready for key input;
- t* represents a thickness of a finger inserted between the key tops and the lid portion; and
- l* represents a distance from the rotary joint to a center of a key top nearest thereto.

20. An information device comprising a keyboard slide mechanism as claimed in

claim 12,

wherein the lid portion can be opened and closed with respect to the body portion by being rotated about a rotary joint and, when the lid portion is closed to a predetermined angle with respect to the body portion, the key tops start being lowered.

21. An information device comprising a keyboard slide mechanism as claimed in claim 13,

wherein the lid portion can be opened and closed with respect to the body portion by being rotated about a rotary joint and, when the lid portion is closed to a predetermined angle with respect to the body portion, the key tops start being lowered.

22. An information device comprising a keyboard slide mechanism as claimed in claim 20,

wherein the following conditional formula is fulfilled:

$$\theta \geq \tan^{-1} (h + la)$$

where

$\theta$  represents the predetermined angle of the lid portion with respect to the body portion;

$h$  represents a height from a top surface of the body portion to a top surface of the key tops in a state ready for key input; and

$la$  represents a distance from the rotary joint to a nearest edge of a top surface of a key top nearest thereto.



23. An information device comprising a keyboard slide mechanism as claimed in claim 21,

wherein the following conditional formula is fulfilled:

$$\theta \geq \tan^{-1} ( h + la )$$

where

- $\theta$  represents the predetermined angle of the lid portion with respect to the body portion;
- $h$  represents a height from a top surface of the body portion to a top surface of the key tops in a state ready for key input; and
- $la$  represents a distance from the rotary joint to a nearest edge of a top surface of a key top nearest thereto.

24. An information device comprising a keyboard slide mechanism as claimed in claim 16,

wherein the keyboard slide mechanism consists of two portions arranged near both ends of the rotary joint, and the two portions of the keyboard slide mechanism operate in synchronism.

25. An information device comprising a keyboard slide mechanism as claimed in claim 17,

wherein the keyboard slide mechanism consists of two portions arranged near both

ends of the rotary joint, and the two portions of the keyboard slide mechanism operate in synchronism.

26. An information device comprising a keyboard slide mechanism as claimed in claim 16,

wherein the keyboard slide mechanism consists of two portions arranged near both ends of the rotary joint, one portion of the keyboard slide mechanism making the sliding member slide when the lid portion is opened with respect to the body portion, the other portion of the keyboard slide mechanism making the sliding member slide when the lid portion is closed with respect to the body portion

27. An information device comprising a keyboard slide mechanism as claimed in claim 17,

wherein the keyboard slide mechanism consists of two portions arranged near both ends of the rotary joint, one portion of the keyboard slide mechanism making the sliding member slide when the lid portion is opened with respect to the body portion, the other portion of the keyboard slide mechanism making the sliding member slide when the lid portion is closed with respect to the body portion

28. An information device comprising a keyboard slide mechanism as claimed in claim 12, further comprising:

alerting means for making a user notice that the lid portion has been opened with respect to the body portion and the keyboard has been brought into a state ready for key input.

29. An information device comprising a keyboard slide mechanism as claimed in claim 13, further comprising:

alerting means for making a user notice that the lid portion has been opened with respect to the body portion and the keyboard has been brought into a state ready for key input.

30. An information device comprising a keyboard slide mechanism as claimed in claim 12,

wherein the lid portion is provided with a display portion.

31. An information device comprising a keyboard slide mechanism as claimed in claim 13,

wherein the lid portion is provided with a display portion.